

**6704**

**G-000-1012.120**

**FERNALD ENVIRONMENTAL MONITORING OHIO EPA RESULTS FROM  
RESIDENTIAL WELL SAMPLING - (CONTAINS SOME CONFIDENTIAL  
INFORMATION)**

**03/10/95**

**OEPA  
45  
LETTER**

**CITIZENS**



State of Ohio Environmental Protection Agency

**Southwest District Office**

401 East Fifth Street  
Dayton, Ohio 45402-2911  
(513) 285-6357  
FAX (513) 285-6249

6704

I-01794

MAR 13 10 55 AM '95

FILE

George V. Voinovich  
Governor

March 10, 1995

RE: FERNALD  
ENVIRONMENTAL MONITORING  
OHIO EPA RESULTS FROM  
RESIDENTIAL WELL SAMPLING

Norman Knollman  
Knollman Farms, Inc.  
7218 Willey Road  
Hamilton, Ohio 45013

Dear Mr. Knollman:

This letter is to provide you with the analytical results of the water from your well and milk samples collected by Ohio EPA's Office of Federal Facilities Oversight staff, Southwest District Office, on December 27, 1994. The split sampling efforts between Ohio EPA and the Fernald Environmental Restoration Management Corporation (FERMCO) are a part of an Agreement in Principle (AIP). The AIP is an agreement between the Department of Energy (DOE) and the State of Ohio to provide independent oversight and conduct environmental monitoring.

Analytical results are expressed in concentrations of micrograms per liter (ug/l) on the water analyses. These units are equivalent to parts per billion (ppb). The samples collected from your well were analyzed for total uranium. The U.S. Environmental Protection Agency (USEPA) has set drinking water standards, or maximum contaminant levels (MCL), for some metals (see attached definitions). However, for total uranium USEPA has established a proposed enforceable standard of 20 ug/l or 20 ppb. All parameters tested from your well water samples were below the maximum contaminant levels (see attached results).

Data from the milk sample collected at your farm on December 27, 1994 are also attached. The results are expressed in pCi/l (see attached definitions). The reported results are consistent with those reported by FERMCO in previous sampling events as well as reported background levels.

The purpose of split sampling is to check the quality of the laboratories' analyses by comparing both parties' sample results. This process ensures that the results reported are accurate. Once FERMCO receives their results, Ohio EPA will make the comparison and you can do the same.



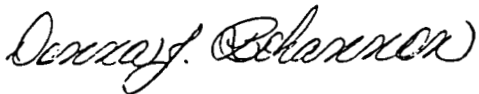
Mr. Norman Knollman, Ohio EPA Results

March 10, 1995

Page 2

If you have any questions concerning this letter, or if I can be of any further assistance, please do not hesitate to contact me at (513) 285-6453 or Kelly Kaletsky at (513) 285-6454.

Sincerely,



Donna J. Bohannon  
Environmental Monitoring Coordinator  
Office of Federal Facilities Oversight

djb

cc: Pat Kraps, FERMCO, w/attachment  
Wally Quaid, DOE, w/attachment  
Kelly Kaletsky, OEPA/OFFO, w/o attachment

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## ENVIRONMENTAL TERMS - DEFINITIONS

Maximum Contaminant Level (MCL): The maximum permissible level of a contaminant in water delivered to any user of a public water system. MCLs are enforceable standards.

Maximum Contaminant Level Goals (MCLGs): A non-enforceable concentration of a drinking water contaminant that is protective of adverse human health effects and allows an adequate margin of safety.

Action Level (AL): A level of a chemical that requires installation of treatment techniques for lowering the contaminant level.

Detection Limit (DL): The detection limit is the lowest level of a chemical that can be distinguished from the normal "noise" of an analytical instrument or method.

Milligrams per Liter (mg/l): A unit used to measure analytical results in concentrations which are equivalent to parts per million (ppm).

Micrograms per Liter (ug/l): A unit used to measure analytical results in concentrations which are equivalent to parts per billion (ppb).

PicoCuries per Liter (pC/l): A unit of measurement for radioactivity. A picocurie is a trillionth of a curie, and represents about 2.2 radioactive particle disintegrations per minute.

CUSTOMER Ross Analytical Services, Inc.  
ATTENTION Lisa Alexander  
ADDRESS 16433 Foltz Industrial PKWY  
CITY Strongsville, OH 44136  
W.O. NO. 95-01-006

RECEIVED  
OHIO EP

FEB 17 1995

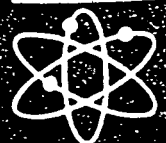
SOUTHWEST DISTRICT

ALBUQUERQUE LABORATORY

6704

$\alpha$   $\beta$

$\gamma$



# REPORT OF ANALYSIS

Water-Total Uranium, Radium-226

Radium 228

TYPE OF ANALYSIS

CUSTOMER ORDER NUMBER

12/29/94

SAMPLES RECEIVED

Customer Identification	Date Collected	Type of Analysis	Sample Vol. (ml)	<u>Results</u>	
				pCi/l	ug/l
RB-1294	12/27/94	Ra226	961	<0.1	
TRB-1294	12/27/94	Ra228	1002	3.1±0.8	
S-15-3	12/28/94	TU	251		170
BOR-14-1	12/28/94	TU	249		220
E-19-2	12/28/94	TU	249		<0.1
N-4-4	12/28/94	TU	244		1.6
JL-40-5	12/28/94	TU	244		2.8
RB-12-94	12/28/94	TU	236		<0.1
PMS-10-5	12/28/94	TU	512		3.5
MS-10-5	12/28/94	Ra226	1002	<0.1	
PMS-10-5	12/28/94	Ra228	971	18.6±3.5	

\* THE RESULT of your WATER sample is highlighted ABOVE.

☐ REPORTED VIA TELEPHONE

☐ FAX

PAGE OF

1 1

**MA Eberline**  
Thermo Analytical Inc.

2021 PAN AMERICAN FREEWAY, N.E.  
BUQUERQUE, NEW MEXICO 87109  
ONE (505) 345-3461  
FAX (505) 761-5416

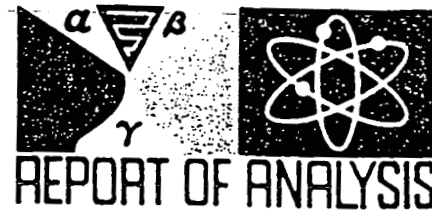
APPROVED BY Mary Kamoss, Data Analyst

DATE

*Mary Kamoss* 2/7/95

000004

CUSTOMER Ross Analytical Services, Inc.  
 ATTENTION Lisa Alexander  
 ADDRESS 16433 Foltz Industrial PKWY.  
 CITY Strongsville, OH 44136  
 W.O. NO. 95-01-005



Milk-Isotopic Uranium

TYPE OF ANALYSIS

CUSTOMER ORDER NUMBER

12/29/94

SAMPLES RECEIVED

Customer Identification	Date Collected	Type of Analysis	Sample Volume (ml)	Results pci/l
OK-14 MILK KNOLLMAN FARM	12/28/94	U234 U235 U238	935	<0.1 <0.1 <0.1
OK-14-S MILK KNOLLMAN FARM	12/28/94	U234 U235 U238	970	<0.1 <0.1 <0.1

\* The Results are highlighted above.

REPORTED VIA TELEPHONE

☐ FAX

PAGE 1 OF 1

**MA Eberline**  
 Thermo Analytical Inc.

21 PAN-AMERICAN FREEWAY, N.E.  
 ALBUQUERQUE, NEW MEXICO 87109  
 ONE (505) 345-3461  
 FAX (505) 761-5416

APPROVED BY Mary Kamoss, Data Analyst

*Mary Kamoss* 1/19/95

000005

March 1995

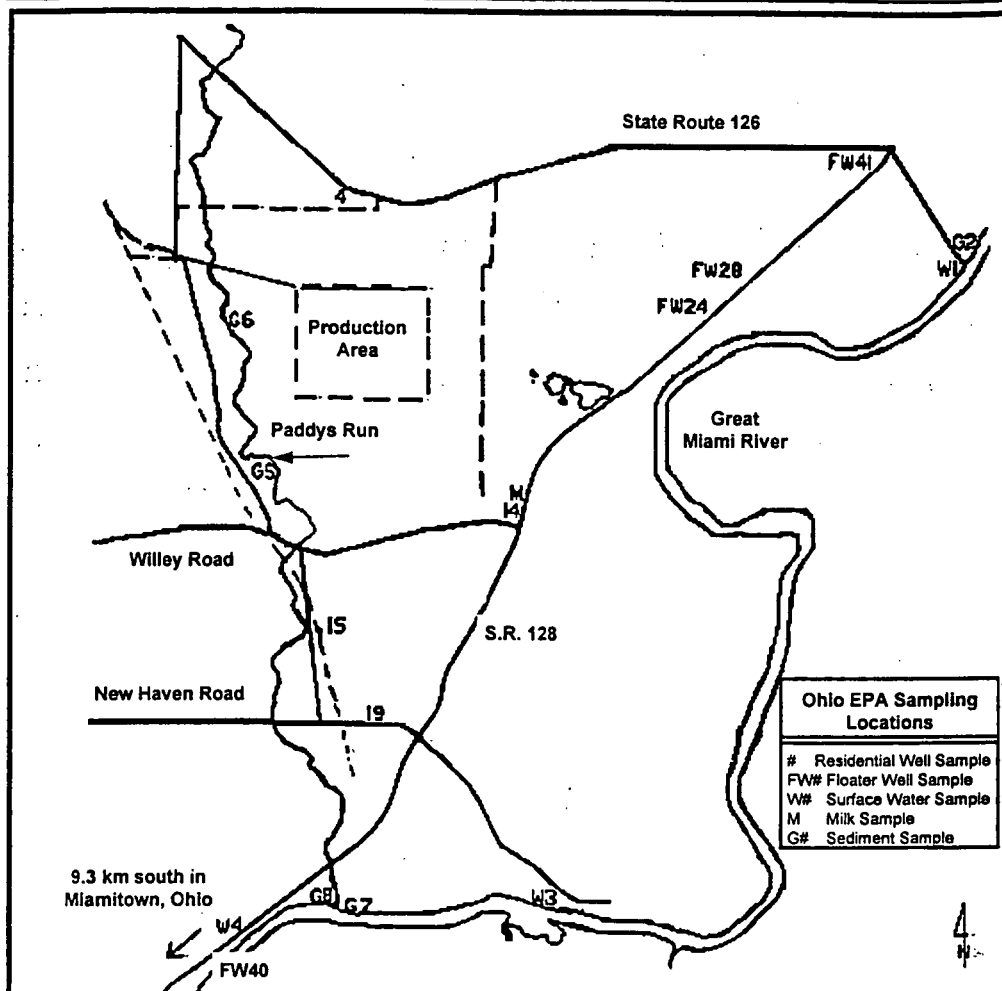
# ENVIRONMENTAL MONITORING AT FERNALD

## Background

The State of Ohio has conducted environmental monitoring at the U.S. Department of Energy's former nuclear production facility in Fernald, Ohio (referred to as FEMP) since 1987. The Ohio Environmental Protection Agency (Ohio EPA) assumed these responsibilities from the Ohio Department of Health in 1994.

Funding for this enhanced technical support is the result of an Agreement in Principle (AIP) between the State of Ohio and the U.S. Department of Energy (DOE). Ohio's objectives in this agreement are: 1) to ensure the adequacy of Fernald's Environmental Monitoring Program (EMP); 2) to provide emergency preparedness; and 3) to encourage public involvement and education. Ohio EPA's Office of Federal Facilities Oversight (OFFO), in cooperation with the Ohio Department of Health, is currently implementing the first objective.

\* Words in italics are defined on the back page.



Sampling locations at the Fernald Environmental Management Project. Data for these locations can be found in the attached tables.

## Evaluation of Fernald's EMP

As part of its obligation under the AIP, Ohio EPA is leading an evaluation of the EMP at Fernald. During this evaluation, OFFO will take a critical look at how environmental monitoring works at Fernald. The evaluation will be documented in a yearly report which will

be available to the public. Since this is not a one-time evaluation, but rather an ongoing effort, public comments on the EMP will be received throughout the year.

OFFO divided the EMP into separate categories for the purpose of evaluation. These areas include private well water, surface water and

sediment, soil and grass, air, foodstuffs (produce, milk, meat and fish), *dose calculation\**, and public concerns. The *media* are evaluated based on sampling locations, *parameters*, analytical methods, field procedures, and analysis/ interpretation of data.



## Ohio EPA Sampling

Since July 1994, OFFO has conducted *split sampling* with Fernald on a monthly basis. Each month, FEMP and OFFO collect one sample that is then divided or 'split'. The two split samples are sent to different laboratories to ensure independent analysis and quality control. The

media that are split sampled include residential ground water wells, surface water, sediment and milk.

Ohio EPA plans to expand its current sampling program at Fernald to include independent sampling (as opposed to split sampling).

## The Next Step

The Ohio EPA environmental monitoring program at Fernald will continue to expand in 1995. Specifically, OFFO will develop a sampling plan to define the scope and methods for our environmental monitoring program. The sampling plan will define and provide a justification for sampling

locations and procedures as well as analytical methods. The sampling plan will address both independent and split sampling.

The evaluation of the Fernald Environmental Monitoring Program will be ongoing in 1995. OFFO will continue to evaluate changes in site conditions and respond to public concerns.

## Definitions

Dose Calculation - The process of estimating the radiation absorbed.

Media - Specific environments—air, water, soil—which are the subject of regulatory concern and activities.

Parameter - The radiological or hazardous contaminant that is tested for in a sampling event (ie. total U, Ra-226).

pCi/L (picocuries per liter) - A unit of measurement for radioactivity. A picocurie is equivalent to the radioactivity present in one trillionth of one gram of pure radium.

ug/L (micrograms per liter) - A unit used to measure analytical results in concentrations which are equivalent to parts per billion (ppb).

Split Sample - Divide one sample in half from a single location. One half is collected by OFFO and the other half by FERMCO's Environmental Monitoring team. The two samples are sent to different labs and the results are compared. This is a quality control check of the lab's work.

Detection Limit (DL) - The detection limit is the lowest level of a chemical that can be distinguished from the normal "noise" of an analytical instrument or method.

Ohio EPA will continue to evaluate the Environmental Monitoring Program at Fernald. We look forward to public input as this review process evolves. It is especially important to receive public feedback during the development of our independent sampling program.

If you have additional comments or questions, we would like to hear from you. Please contact Ohio EPA's Office of Federal Facilities Oversight at:

Ohio EPA  
Attn: Laura Hegge  
401 East Fifth Street  
Dayton, Ohio 45402-2911  
1-800-686-8930



March 1995

# ENVIRONMENTAL MONITORING AT FERNALD

## BACKGROUND REFERENCE SHEET

Background refers to the naturally occurring amount of a material in the environment. The values listed below represent an approximate range. The values listed only represent those parameters for which Ohio EPA currently samples. Background values for ground water, surface water, and sediment are taken from the Fernald Operable Unit 5 Remedial Investigation Report (October 1994). Background values for milk are taken from the 1993 Site Environmental Report.

### Ground Water/Residential Wells -

Background for Total Uranium in the Great Miami Aquifer is approximately 1.2 ug/L

### Surface Water -

Background values for both the Great Miami River and Paddys Run are approximately:

	<u>Great Miami River</u>	<u>Paddys Run</u>
Total U	1.40 ug/L	1.10 ug/L
Radium-226	0.41 pCi/L	0.35 pCi/L
Radium-228	2.20 pCi/L	2.10 pCi/L

### Milk -

The background value for milk is taken about 23 miles WSW of the Fernald site:

Uranium-234	0.0650 ± 0.0330 pCi/L
Uranium-235	-0.0035 ± 0.0076 pCi/L
Uranium-238	0.0670 ± 0.0330 pCi/L

### Sediment -

Background for sediment in both the Great Miami River and Paddys Run are approximately:

	<u>Great Miami River</u>	<u>Paddys Run</u>
Total U	3.00 ug/g	3.00 ug/g
Radium-226	0.57 pCi/g	0.50 pCi/g
Thorium-228	not detected	not available
Thorium-230	0.72 pCi/g	"
Thorium-232	0.80 pCi/g	"
Cesium-137	not detected	"

## PROPOSED DRINKING WATER STANDARDS:

The proposed US EPA standard for uranium in drinking water is 20 ug/L.

The proposed US EPA standard for radium-226 in drinking water is 20 pCi/L.

The proposed US EPA standard for radium-228 in drinking water is 20 pCi/L.



**GROUND WATER/RESIDENTIAL WELLS  
1994 SAMPLING RESULTS FOR TOTAL URANIUM (ug/L)**

WELL # →	4	14	15	19	Floater (FW#)
SEPTEMBER	1.38	1.89	177.00	<0.10	0.57 (FW24)
OCTOBER	1.23	1.78	144.00	<0.10	0.38 (FW28)
NOVEMBER	1.20	2.00	179.00	<0.10	0.43 (FW41)
DECEMBER	1.60	2.00	170.00	<0.10	2.80 (FW40)

**SURFACE WATER  
1994 SAMPLING RESULTS**

MONTH/LOCATION	TOTAL U (ug/L)	Radium-226 (pCi/L)	Radium-228 (pCi/L)
SEPTEMBER	W1 1.47	<1.00	1.98
	W3 1.47	<1.00	<1.00
	W4 1.00	<1.00	2.49
OCTOBER	W1 1.74	<1.00	5.06
	W3 1.78	<1.00	<1.00
	W4 1.93	<1.00	<1.00
NOVEMBER	W1 1.47	<1.00	<1.00
	W3 1.47	<1.00	<1.00
	W4 1.47	<1.00	<1.00

**MILK  
1994 SAMPLING RESULTS**

MONTH/LOCATION	U-234 (pCi/L)	U-235 (pCi/L)	U-238 (pCi/L)
SEPTEMBER M	0.0249	<0.0268	<0.0239
DECEMBER M	<0.1000	<0.1000	<0.1000

**SEDIMENT  
SAMPLING RESULTS (NOVEMBER, 1994)**

PARAMETER	G2	G7	G8	G5	G6
Total Uranium (ug/g)	1.33	1.42	1.16	1.09	1.25
Radium-226 (pCi/g)	0.31	0.34	0.38	<0.25	0.53
Thorium-228 (pCi/g)	<0.10	0.11	0.10	<0.10	<0.10
Thorium-230 (pCi/g)	0.10	0.72	0.15	0.20	<0.10
Thorium-232 (pCi/g)	<0.10	<0.10	<0.10	<0.10	<0.10
Cesium-137 (pCi/g)	<0.10	<0.17	<0.15	<0.16	<0.12
Lead-212 (pCi/g)	NR*	NR	0.31	0.24	0.22
Lead-214 (pCi/g)	0.41	NR	0.36	NR	0.33
Potassium-40 (pCi/g)	7.41	NR	NR	9.37	6.13

\* Not Reported — Lead and potassium were not requested for sediment analysis. They were only reported when detected.



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State of Ohio Environmental Protection Agency

## Southwest District Office

401 East Fifth Street  
Dayton, Ohio 45402-2911  
(513) 285-6357  
FAX (513) 285-6249

George V. Voinovich  
Governor

March 10, 1995

RE: FERNALD  
ENVIRONMENTAL MONITORING  
OHIO EPA RESULTS FROM  
RESIDENTIAL WELL SAMPLING

Mr. Ronald Poston  
Delta Steel Corporation  
P.O. Box 39040  
Cincinnati, Ohio 45239-0040

Dear Mr. Poston:

This letter is to provide you with the analytical results of water samples collected from your well by Ohio EPA's Office of Federal Facilities Oversight staff, Southwest District Office, on December 27, 1994. The split sampling efforts between Ohio EPA and the Fernald Environmental Restoration Management Corporation (FERMCO) are a part of an Agreement in Principle (AIP). The AIP is an agreement between the Department of Energy (DOE) and the State of Ohio to provide independent oversight and conduct environmental monitoring.

The analytical results are expressed in concentrations of micrograms per liter (ug/l). These units are equivalent to parts per billion (ppb). The samples collected from your well were analyzed for total uranium. The U.S. Environmental Protection Agency (USEPA) has set drinking water standards, or maximum contaminant levels (MCL), for some metals (see attached definitions). However for total uranium, USEPA has established a proposed enforceable standard of 20 ug/l or 20 ppb that will come into effect in the future. The analytical result the laboratory reported on your well sample for total uranium is 170 ug/l on 12/27/94. Although these values are over the proposed MCL for total uranium (20 ppb), historically, they are within the range of results FERMCO's laboratory has detected through their monthly sampling events.

The purpose of split sampling is to check the quality of the laboratories' analyses by comparing both parties' sample results. This process ensures that the results reported are accurate. Once FERMCO receives their results, Ohio EPA will make the comparison and you can do the same. Also, Ohio EPA will continue to sample your well monthly and continue to compare both labs' analytical results.

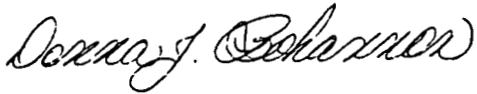
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Mr. Ronald Poston, Ohio EPA Results  
March 10, 1995  
Page 2

If you have any questions concerning this letter, or if I can be of any further assistance, please do not hesitate to contact me at (513) 285-6453 or Kelly Kaletsky at (513) 285-6454.

Sincerely,



Donna J. Bohannon  
Environmental Monitoring Coordinator  
Office of Federal Facilities Oversight

djb

cc: Pat Kraps, FERMCO, w/attachment  
~~Wally Qualder, DOE, w/attachment~~  
Kelly Kaletsky, OEPA/OFFO, w/o attachment

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## ENVIRONMENTAL TERMS - DEFINITIONS

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 ATTENTION Lisa Alexander  
 ADDRESS 16433 Foltz Industrial PKWY  
 CITY Strongsville, OH 44136  
 W.O. NO. 95-01-006

RECEIVED  
 OHIO EP

FEB 17 1995

SOUTHWEST DISTRICT

REPORT OF ANALYSIS

Water-Total Uranium, Radium-226

Radium 228

TYPE OF ANALYSIS

CUSTOMER ORDER NUMBER

12/29/94

SAMPLES RECEIVED

Customer  
 Identification

Date  
 Collected

Type of  
 Analysis

Sample  
 Vol. (ml)

pci/l

ug/l

*Results*

RB-1294

12/27/94

Ra226

961

<0.1

TRB-1294

12/27/94

Ra228

1002

3.1±0.8

SP-15-3

12/28/94

TU

251

12.0

BOK-14-1

12/28/94

TU

249

2.0

E-19-2

12/28/94

TU

249

<0.1

FN-4-4

12/28/94

TU

244

1.6

JL-40-5

12/28/94

TU

244

2.8

RB-12-94

12/28/94

TU

236

<0.1

PMS-10-5

12/28/94

TU

512

3.5

MS-10-5

12/28/94

Ra226

1002

<0.1

PMS-10-5

12/28/94

Ra228

971

18.6±3.5

\* The Result of your water sample is highlighted above.

☐ REPORTED VIA TELEPHONE

☐ FAX

PAGE OF

1 1

**MA Eberline**  
 Thermo Analytical Inc.

2021 PAN AMERICAN FREEWAY, N.E.  
 ALBUQUERQUE, NEW MEXICO 87109  
 ONE (505) 345-3461  
 FAX (505) 761-5416

APPROVED BY Mary Kamoss, Data Analyst

*Mary Kamoss* 2/7/95

00001



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401 East Fifth Street  
Dayton, Ohio 45402-2911  
1-800-686-8930



March 1995

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# ENVIRONMENTAL MONITORING AT FERNALD

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Cesium-137	not detected	"

## PROPOSED DRINKING WATER STANDARDS:

The proposed US EPA standard for uranium in drinking water is 20 ug/L.

The proposed US EPA standard for radium-226 in drinking water is 20 pCi/L.

The proposed US EPA standard for radium-228 in drinking water is 20 pCi/L.

**GROUND WATER/RESIDENTIAL WELLS  
1994 SAMPLING RESULTS FOR TOTAL URANIUM (ug/L)**

WELL # →	4	14	15	19	Floater (FW#)
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OCTOBER	1.23	1.78	144.00	<0.10	0.38 (FW28)
NOVEMBER	1.20	2.00	179.00	<0.10	0.43 (FW41)
DECEMBER	1.60	2.00	170.00	<0.10	2.80 (FW40)

**SURFACE WATER  
1994 SAMPLING RESULTS**

MONTH/LOCATION	TOTAL U (ug/L)	Radium-226 (pCi/L)	Radium-228 (pCi/L)
SEPTEMBER	W1 1.47	<1.00	1.98
	W3 1.47	<1.00	<1.00
	W4 1.00	<1.00	2.49
OCTOBER	W1 1.74	<1.00	5.06
	W3 1.78	<1.00	<1.00
	W4 1.93	<1.00	<1.00
NOVEMBER	W1 1.47	<1.00	<1.00
	W3 1.47	<1.00	<1.00
	W4 1.47	<1.00	<1.00

**MILK  
1994 SAMPLING RESULTS**

MONTH/LOCATION	U-234 (pCi/L)	U-235 (pCi/L)	U-238 (pCi/L)
SEPTEMBER M	0.0249	<0.0268	<0.0239
DECEMBER M	<0.1000	<0.1000	<0.1000

**SEDIMENT  
SAMPLING RESULTS (NOVEMBER, 1994)**

PARAMETER	G2	G7	G8	G5	G6
Total Uranium (ug/g)	1.33	1.42	1.16	1.09	1.25
Radium-226 (pCi/g)	0.31	0.34	0.38	<0.25	0.53
Thorium-228 (pCi/g)	<0.10	0.11	0.10	<0.10	<0.10
Thorium-230 (pCi/g)	0.10	0.72	0.15	0.20	<0.10
Thorium-232 (pCi/g)	<0.10	<0.10	<0.10	<0.10	<0.10
Cesium-137 (pCi/g)	<0.10	<0.17	<0.15	<0.16	<0.12
Lead-212 (pCi/g)	NR*	NR	0.31	0.24	0.22
Lead-214 (pCi/g)	0.41	NR	0.36	NR	0.33
Potassium-40 (pCi/g)	7.41	NR	NR	9.37	6.13

\* Not Reported — Lead and potassium were not requested for sediment analysis. They were only reported when detected.



State of Ohio Environmental Protection Agency

**Southwest District Office**

401 East Fifth Street  
Dayton, Ohio 45402-2911  
(513) 285-6357  
FAX (513) 285-6249

George V. Voinovich  
Governor

March 10, 1995

RE: FERNALD  
ENVIRONMENTAL MONITORING  
OHIO EPA RESULTS FROM  
RESIDENTIAL WELL SAMPLING

Ray Evers Welding Company  
Attention: Manager  
4849 Blue Rock Road  
Cincinnati, Ohio 45239

Dear Manager:

This letter is to provide you with the analytical results of the water samples collected from your well by Ohio EPA's Office of Federal Facilities Oversight staff, Southwest District Office, on December 27, 1994. The split sampling efforts between Ohio EPA and the Fernald Environmental Restoration Management Corporation (FERMCO) are a part of an Agreement in Principle (AIP). The AIP is an agreement between the Department of Energy (DOE) and the State of Ohio to provide independent oversight and conduct environmental monitoring.

Analytical results are expressed in concentrations of micrograms per liter (ug/l). These units are equivalent to parts per billion (ppb). The samples collected from your well were analyzed for total uranium. The U.S. Environmental Protection Agency (USEPA) has set drinking water standards, or maximum contaminant levels (MCL), for some metals (see attached definitions). However, for total uranium USEPA has established a proposed enforceable standard of 20 ug/l or 20 ppb. All parameters tested from your well water samples were below the maximum contaminant levels (see attached results).

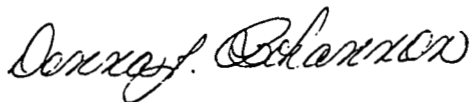
The purpose of split sampling is to check the quality of the laboratories' analyses by comparing both parties' sample results. This process ensures that the results reported are accurate. Once FERMCO receives their results, Ohio EPA will make the comparison and you can do the same.



Ray Evers, Ohio EPA Results  
March 10, 1995  
Page 2

If you have any questions concerning this letter, or if I can be of any further assistance, please do not hesitate to contact me at (513) 285-6453 or Kelly Kaletsky at (513) 284-6454.

Sincerely,



Donna J. Bohannon  
Environmental Monitoring Coordinator  
Office of Federal Facilities Oversight

djb

cc: Pat Kraps, FERMCO, w/attachment  
~~Wally Quader, DOE, w/attachment~~  
Kelly Kaletsky, OEPA/OFFO, w/o attachment

000019

## ENVIRONMENTAL TERMS - DEFINITIONS

Maximum Contaminant Level (MCL): The maximum permissible level of a contaminant in water delivered to any user of a public water system. MCLs are enforceable standards.

Maximum Contaminant Level Goals (MCLGs): A non-enforceable concentration of a drinking water contaminant that is protective of adverse human health effects and allows an adequate margin of safety.

Action Level (AL): A level of a chemical that requires installation of treatment techniques for lowering the contaminant level.

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Micrograms per Liter (ug/l): A unit used to measure analytical results in concentrations which are equivalent to parts per billion (ppb).

PicoCuries per Liter (pC/l): A unit of measurement for radioactivity. A picocurie is a trillionth of a curie, and represents about 2.2 radioactive particle disintegrations per minute.

CUSTOMER Ross Analytical Services, Inc.  
ATTENTION Lisa Alexander  
ADDRESS 16433 Foltz Industrial PKWY  
CITY Strongsville, OH 44136  
W.O. NO. 95-01-006

RECEIVED  
OHIO EP

FEB 17 1995

SOUTHWEST DISTRICT



## REPORT OF ANALYSIS

Water-Total Uranium, Radium 226

Radium 228

TYPE OF ANALYSIS

CUSTOMER ORDER NUMBER

12/29/94

SAMPLES RECEIVED

Customer  
IdentificationDate  
CollectedType of  
AnalysisSample  
Vol. (ml)

pci/l

Results

ug/l

RB-1294

12/27/94

Ra226

961

&lt;0.1

TRB-1294

12/27/94

Ra228

1002

3.1±0.8

S-15-3

12/28/94

TU

251

170

BOK-14-1

12/28/94

TU

249

2.0

RB-1294

12/28/94

TU

249

&lt;0.1

RN-4-4

12/28/94

TU

244

1.6

JL-40-5

12/28/94

TU

244

2.8

RB-12-94

12/28/94

TU

236

&lt;0.1

PMS-10-5

12/28/94

TU

512

3.5

MS-10-5

12/28/94

Ra226

1002

&lt;0.1

PMS-10-5

12/28/94

Ra228

971

18.6±3.5

\* THE RESULT of your WATER sample is highlighted ABOVE.

☐ REPORTED VIA TELEPHONE☐ FAX

PAGE OF

1 1

**MA Eberline**  
Thermo Analytical Inc.

2021 PAN AMERICAN FREEWAY, N.E.  
ALBUQUERQUE, NEW MEXICO 87109  
ONE (505) 345-3461  
FAX (505) 761-5416

APPROVED BY Mary Kamoss, Data Analyst

000021

March 1995

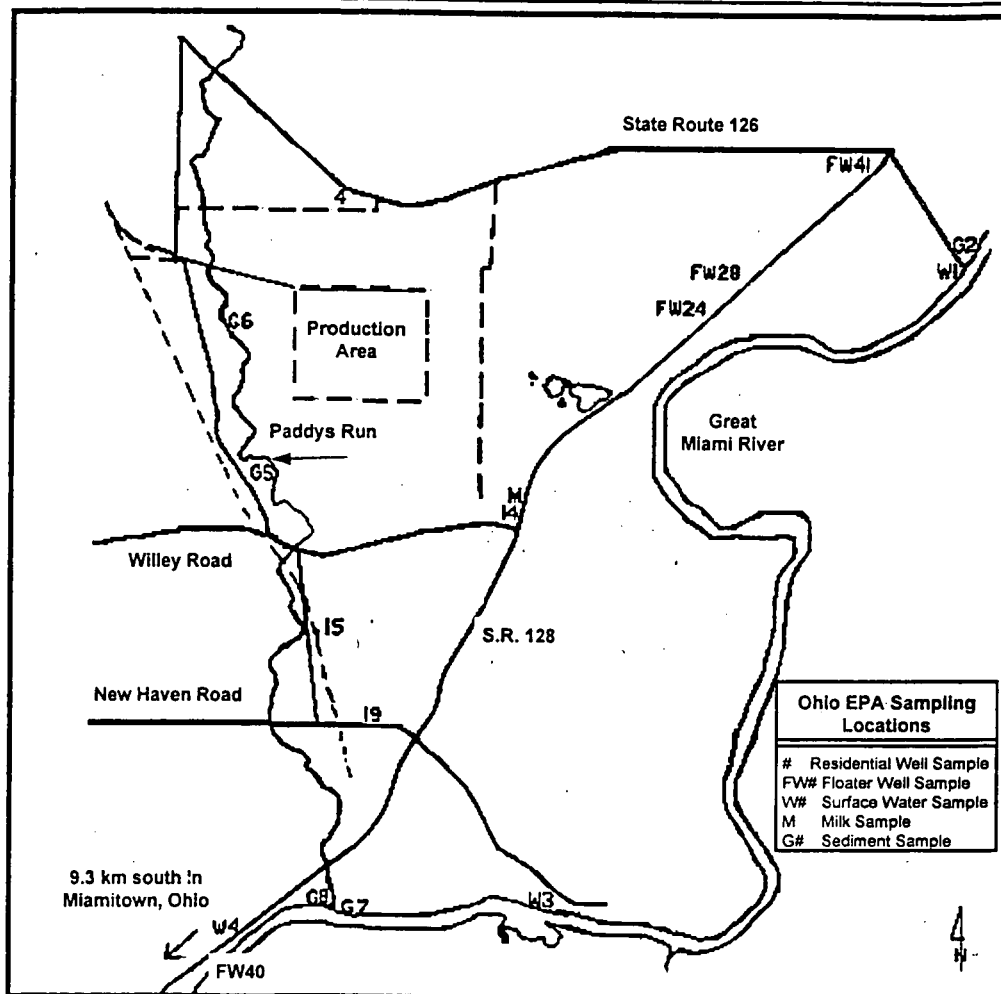
# ENVIRONMENTAL MONITORING AT FERNALD

## Background

The State of Ohio has conducted environmental monitoring at the U.S. Department of Energy's former nuclear production facility in Fernald, Ohio (referred to as FEMP) since 1987. The Ohio Environmental Protection Agency (Ohio EPA) assumed these responsibilities from the Ohio Department of Health in 1994.

Funding for this enhanced technical support is the result of an Agreement in Principle (AIP) between the State of Ohio and the U.S. Department of Energy (DOE). Ohio's objectives in this agreement are: 1) to ensure the adequacy of Fernald's Environmental Monitoring Program (EMP); 2) to provide emergency preparedness; and 3) to encourage public involvement and education. Ohio EPA's Office of Federal Facilities Oversight (OFFO), in cooperation with the Ohio Department of Health, is currently implementing the first objective.

\* Words in italics are defined on the back page.



Sampling locations at the Fernald Environmental Management Project. Data for these locations can be found in the attached tables.

## Evaluation of Fernald's EMP

As part of its obligation under the AIP, Ohio EPA is leading an evaluation of the EMP at Fernald. During this evaluation, OFFO will take a critical look at how environmental monitoring works at Fernald. The evaluation will be documented in a yearly report which will

be available to the public. Since this is not a one-time evaluation, but rather an ongoing effort, public comments on the EMP will be received throughout the year.

OFFO divided the EMP into separate categories for the purpose of evaluation. These areas include private well water, surface water and

sediment, soil and grass, air, foodstuffs (produce, milk, meat and fish), dose calculation\*, and public concerns. The *media* are evaluated based on sampling locations, *parameters*, analytical methods, field procedures, and analysis/ interpretation of data.



## Ohio EPA Sampling

Since July 1994, OFFO has conducted *split sampling* with Fernald on a monthly basis. Each month, FEMP and OFFO collect one sample that is then divided or 'split'. The two split samples are sent to different laboratories to ensure independent analysis and quality control. The

media that are split sampled include residential ground water wells, surface water, sediment and milk.

Ohio EPA plans to expand its current sampling program at Fernald to include independent sampling (as opposed to split sampling).

## The Next Step

The Ohio EPA environmental monitoring program at Fernald will continue to expand in 1995. Specifically, OFFO will develop a sampling plan to define the scope and methods for our environmental monitoring program. The sampling plan will define and provide a justification for sampling

locations and procedures as well as analytical methods. The sampling plan will address both independent and split sampling.

The evaluation of the Fernald Environmental Monitoring Program will be ongoing in 1995. OFFO will continue to evaluate changes in site conditions and respond to public concerns.

## Definitions

Dose Calculation - The process of estimating the radiation absorbed.

Media - Specific environments—air, water, soil—which are the subject of regulatory concern and activities.

Parameter - The radiological or hazardous contaminant that is tested for in a sampling event (ie. total U, Ra-226).

pCi/L (picocuries per liter) - A unit of measurement for radioactivity. A picocurie is equivalent to the radioactivity present in one trillionth of one gram of pure radium.

ug/L (micrograms per liter) - A unit used to measure analytical results in concentrations which are equivalent to parts per billion (ppb).

Split Sample - Divide one sample in half from a single location. One half is collected by OFFO and the other half by FERMCO's Environmental Monitoring team. The two samples are sent to different labs and the results are compared. This is a quality control check of the lab's work.

Detection Limit (DL) - The detection limit is the lowest level of a chemical that can be distinguished from the normal "noise" of an analytical instrument or method.

Ohio EPA will continue to evaluate the Environmental Monitoring Program at Fernald. We look forward to public input as this review process evolves. It is especially important to receive public feedback during the development of our independent sampling program.

If you have additional comments or questions, we would like to hear from you. Please contact Ohio EPA's Office of Federal Facilities Oversight at:

Ohio EPA  
Attn: Laura Hegge  
401 East Fifth Street  
Dayton, Ohio 45402-2911  
1-800-686-8930

March 1995

# ENVIRONMENTAL MONITORING AT FERNALD

## BACKGROUND REFERENCE SHEET

Background refers to the naturally occurring amount of a material in the environment. The values listed below represent an approximate range. The values listed only represent those parameters for which Ohio EPA currently samples. Background values for ground water, surface water, and sediment are taken from the Fernald Operable Unit 5 Remedial Investigation Report (October 1994). Background values for milk are taken from the 1993 Site Environmental Report.

### Ground Water/Residential Wells -

Background for Total Uranium in the Great Miami Aquifer is approximately 1.2 ug/L.

### Surface Water -

Background values for both the Great Miami River and Paddys Run are approximately:

	<u>Great Miami River</u>	<u>Paddys Run</u>
Total U	1.40 ug/L	1.10 ug/L
Radium-226	0.41 pCi/L	0.35 pCi/L
Radium-228	2.20 pCi/L	2.10 pCi/L

### Milk -

The background value for milk is taken about 23 miles WSW of the Fernald site:

Uranium-234	0.0650 ± 0.0330 pCi/L
Uranium-235	-0.0035 ± 0.0076 pCi/L
Uranium-238	0.0670 ± 0.0330 pCi/L

### Sediment -

Background for sediment in both the Great Miami River and Paddys Run are approximately:

	<u>Great Miami River</u>	<u>Paddys Run</u>
Total U	3.00 ug/g	3.00 ug/g
Radium-226	0.57 pCi/g	0.50 pCi/g
Thorium-228	not detected	not available
Thorium-230	0.72 pCi/g	"
Thorium-232	0.80 pCi/g	"
Cesium-137	not detected	"

## PROPOSED DRINKING WATER STANDARDS:

The proposed US EPA standard for uranium in drinking water is 20 ug/L.  
The proposed US EPA standard for radium-226 in drinking water is 20 pCi/L.  
The proposed US EPA standard for radium-228 in drinking water is 20 pCi/L.

**GROUND WATER/RESIDENTIAL WELLS  
1994 SAMPLING RESULTS FOR TOTAL URANIUM (ug/L)**

WELL # →	4	14	15	19	Floater (FW#)
SEPTEMBER	1.38	1.89	177.00	<0.10	0.57 (FW24)
OCTOBER	1.23	1.78	144.00	<0.10	0.38 (FW28)
NOVEMBER	1.20	2.00	179.00	<0.10	0.43 (FW41)
DECEMBER	1.60	2.00	170.00	<0.10	2.80 (FW40)

**SURFACE WATER  
1994 SAMPLING RESULTS**

MONTH/LOCATION	TOTAL U (ug/L)	Radium-226 (pCi/L)	Radium-228 (pCi/L)
SEPTEMBER	W1 1.47	<1.00	1.98
	W3 1.47	<1.00	<1.00
	W4 1.00	<1.00	2.49
OCTOBER	W1 1.74	<1.00	5.06
	W3 1.78	<1.00	<1.00
	W4 1.93	<1.00	<1.00
NOVEMBER	W1 1.47	<1.00	<1.00
	W3 1.47	<1.00	<1.00
	W4 1.47	<1.00	<1.00

**MILK  
1994 SAMPLING RESULTS**

MONTH/LOCATION	U-234 (pCi/L)	U-235 (pCi/L)	U-238 (pCi/L)
SEPTEMBER M	0.0249	<0.0268	<0.0239
DECEMBER M	<0.1000	<0.1000	<0.1000

**SEDIMENT  
SAMPLING RESULTS (NOVEMBER, 1994)**

PARAMETER	G2	G7	G8	G5	G6
Total Uranium (ug/g)	1.33	1.42	1.16	1.09	1.25
Radium-226 (pCi/g)	0.31	0.34	0.38	<0.25	0.53
Thorium-228 (pCi/g)	<0.10	0.11	0.10	<0.10	<0.10
Thorium-230 (pCi/g)	0.10	0.72	0.15	0.20	<0.10
Thorium-232 (pCi/g)	<0.10	<0.10	<0.10	<0.10	<0.10
Cesium-137 (pCi/g)	<0.10	<0.17	<0.15	<0.16	<0.12
Lead-212 (pCi/g)	NR*	NR	0.31	0.24	0.22
Lead-214 (pCi/g)	0.41	NR	0.36	NR	0.33
Potassium-40 (pCi/g)	7.41	NR	NR	9.37	6.13

\* Not Reported — Lead and potassium were not requested for sediment analysis. They were only reported when detected.



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Southwest District Office, 401 East Fifth Street, Dayton 45402-2911

(513) 285-6357

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6704 -

State of Ohio Environmental Protection Agency

## Southwest District Office

401 East Fifth Street  
Dayton, Ohio 45402-2911  
(513) 285-6357  
FAX (513) 285-6249

George V. Voinovich  
Governor

March 10, 1995

RE: FERNALD  
ENVIRONMENTAL MONITORING  
OHIO EPA RESULTS FROM  
RESIDENTIAL WELL SAMPLING

Mr. A. J. Nieman  
3881 Cincinnati-Brookville Rd.  
Hamilton, Ohio 45013

Dear Mr. Nieman:

This letter is to provide you with the analytical results of the water samples collected from your well by Ohio EPA's Office of Federal Facilities Oversight staff, Southwest District Office, on December 27, 1994. The split sampling efforts between Ohio EPA and the Fernald Environmental Restoration Management Corporation (FERMCO) are a part of an Agreement in Principle (AIP). The AIP is an agreement between the Department of Energy (DOE) and the State of Ohio to provide independent oversight and conduct environmental monitoring.

Analytical results are expressed in concentrations of micrograms per liter (ug/l). These units are equivalent to parts per billion (ppb). The samples collected from your well were analyzed for total uranium. The U.S. Environmental Protection Agency (USEPA) has set drinking water standards, or maximum contaminant levels (MCL), for some metals (see attached definitions). However, for total uranium USEPA has established a proposed enforceable standard of 20 ug/l or 20 ppb. All parameters tested from your well water samples were below the maximum contaminant levels (see attached results).

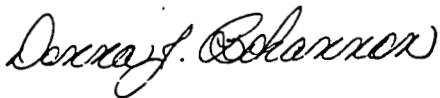
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000026

Mr. A.J. Nieman, Ohio EPA Results  
March 10, 1995  
Page 2

If you have any questions concerning this letter, or if I can be of any further assistance, please do not hesitate to contact me at (513) 285-6453 or Kelly Kaletsky at (513) 285-6454.

Sincerely,



Donna J. Bohannon  
Environmental Monitoring Coordinator  
Office of Federal Facilities Oversight

djb

cc: Pat Kraps, FERMCO, w/attachment  
~~Wally Quader, DOE, w/attachment~~  
Kelly Kaletsky, OEPA/OFFO, w/o attachment

000027

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CUSTOMER Ross Analytical Services, Inc.  
ATTENTION Lisa Alexander  
ADDRESS 16433 Foltz Industrial PKWY  
CITY Strongsville, OH 44136  
W.O. NO. 95-01-006

RECEIVED  
OHIO EP

FEB 17 1995

SOUTHWEST DISTRICT

REPORT OF ANALYSIS

Water-Total Uranium, Radium 226

Radium 228

TYPE OF ANALYSIS

CUSTOMER ORDER NUMBER

12/29/94

SAMPLES RECEIVED

Customer  
IdentificationDate  
CollectedType of  
AnalysisSample  
Vol. (ml)

pci/l

ug/l

Results

RB-1294

12/27/94

Ra226

961

&lt;0.1

TRB-1294

12/27/94

Ra228

1002

3.1±0.8

S-15-3

12/28/94

TU

251

170

BOK-14-1

12/28/94

TU

249

2.0

E-19-2

12/28/94

TU

249

&lt;0.1

4-4

12/28/94

TU

244

1.6

JL-40-5

12/28/94

TU

244

2.8

RB-12-94

12/28/94

TU

236

&lt;0.1

PMS-10-5

12/28/94

TU

512

3.5

MS-10-5

12/28/94

Ra226

1002

&lt;0.1

PMS-10-5

12/28/94

Ra228

971

18.6±3.5

\* The Result of your water sample is high lighted ABOVE.

☐ REPORTED VIA TELEPHONE☐ FAX

PAGE OF

1 1

**MA Eberline**  
Thermo Analytical Inc.

21 PAN AMERICAN FREEWAY, N.E.  
BUQUERQUE, NEW MEXICO 87109  
ONE (505) 345-3461  
FAX (505) 761-5316

APPROVED BY Mary Kamoss, Data Analyst

*[Signature]* 2/1/95 0029

March 1995

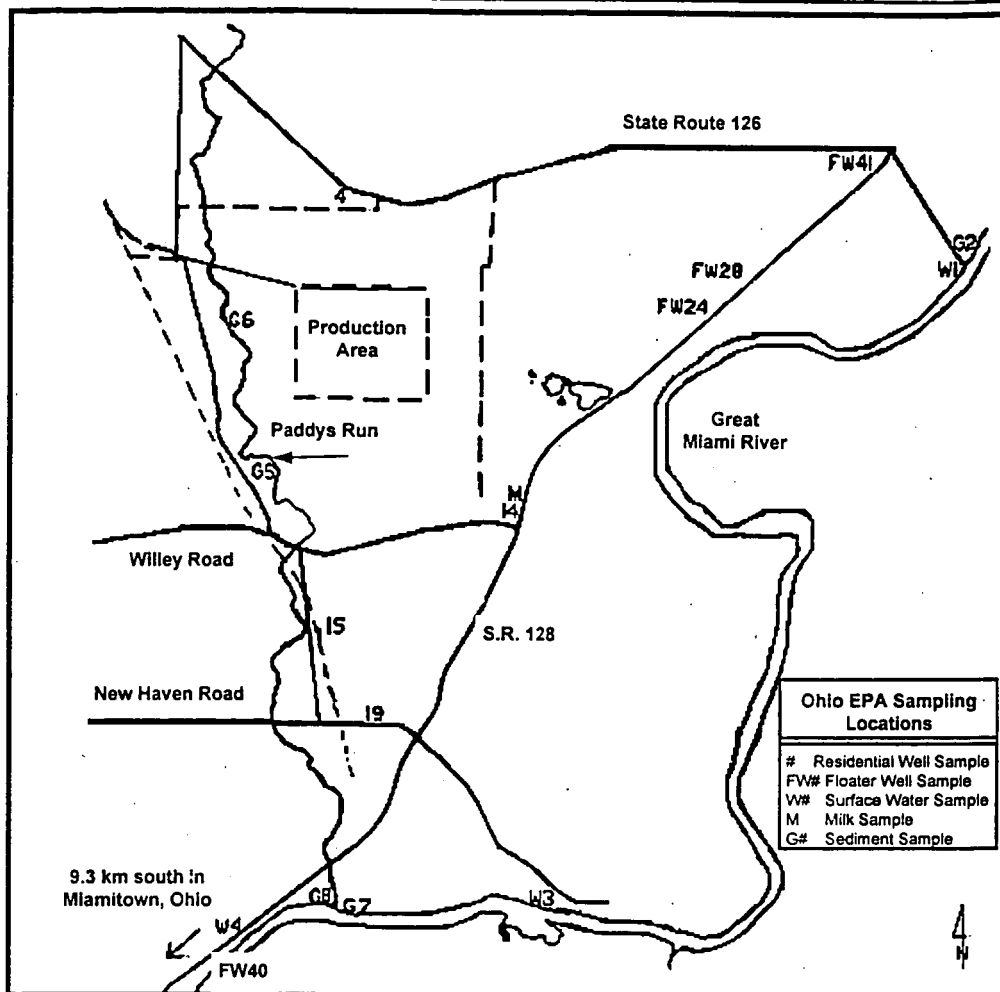
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Ohio EPA  
Attn: Laura Hegge  
401 East Fifth Street  
Dayton, Ohio 45402-2911  
1-800-686-8930



March 1995

---

# ENVIRONMENTAL MONITORING AT FERNALD

---

## BACKGROUND REFERENCE SHEET

Background refers to the naturally occurring amount of a material in the environment. The values listed below represent an approximate range. The values listed only represent those parameters for which Ohio EPA currently samples. Background values for ground water, surface water, and sediment are taken from the Fernald Operable Unit 5 Remedial Investigation Report (October 1994). Background values for milk are taken from the 1993 Site Environmental Report.

### Ground Water/Residential Wells -

Background for Total Uranium in the Great Miami Aquifer is approximately 1.2 ug/L

### Surface Water -

Background values for both the Great Miami River and Paddys Run are approximately:

	<u>Great Miami River</u>	<u>Paddys Run</u>
Total U	1.40 ug/L	1.10 ug/L
Radium-226	0.41 pCi/L	0.35 pCi/L
Radium-228	2.20 pCi/L	2.10 pCi/L

### Milk -

The background value for milk is taken about 23 miles WSW of the Fernald site:

Uranium-234	0.0650 ± 0.0330 pCi/L
Uranium-235	-0.0035 ± 0.0076 pCi/L
Uranium-238	0.0670 ± 0.0330 pCi/L

### Sediment -

Background for sediment in both the Great Miami River and Paddys Run are approximately:

	<u>Great Miami River</u>	<u>Paddys Run</u>
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Radium-226	0.57 pCi/g	0.50 pCi/g
Thorium-228	not detected	not available
Thorium-230	0.72 pCi/g	"
Thorium-232	0.80 pCi/g	"
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## PROPOSED DRINKING WATER STANDARDS:

The proposed US EPA standard for uranium in drinking water is 20 ug/L.

The proposed US EPA standard for radium-226 in drinking water is 20 pCi/L.

The proposed US EPA standard for radium-228 in drinking water is 20 pCi/L.

**GROUND WATER/RESIDENTIAL WELLS  
1994 SAMPLING RESULTS FOR TOTAL URANIUM (ug/L)**

WELL # →	4	14	15	19	Floater (FW#)
SEPTEMBER	1.38	1.89	177.00	<0.10	0.57 (FW24)
OCTOBER	1.23	1.78	144.00	<0.10	0.38 (FW28)
NOVEMBER	1.20	2.00	179.00	<0.10	0.43 (FW41)
DECEMBER	1.60	2.00	170.00	<0.10	2.80 (FW40)

**SURFACE WATER  
1994 SAMPLING RESULTS**

MONTH/LOCATION	TOTAL U (ug/L)	Radium-226 (pCi/L)	Radium-228 (pCi/L)
SEPTEMBER	W1	1.47	<1.00
	W3	1.47	<1.00
	W4	1.00	<1.00
OCTOBER	W1	1.74	<1.00
	W3	1.78	<1.00
	W4	1.93	<1.00
NOVEMBER	W1	1.47	<1.00
	W3	1.47	<1.00
	W4	1.47	<1.00

**MILK  
1994 SAMPLING RESULTS**

MONTH/LOCATION	U-234 (pCi/L)	U-235 (pCi/L)	U-238 (pCi/L)
SEPTEMBER M	0.0249	<0.0268	<0.0239
DECEMBER M	<0.1000	<0.1000	<0.1000

**SEDIMENT  
SAMPLING RESULTS (NOVEMBER, 1994)**

PARAMETER	G2	G7	G8	G5	G6
Total Uranium (ug/g)	1.33	1.42	1.16	1.09	1.25
Radium-226 (pCi/g)	0.31	0.34	0.38	<0.25	0.53
Thorium-228 (pCi/g)	<0.10	0.11	0.10	<0.10	<0.10
Thorium-230 (pCi/g)	0.10	0.72	0.15	0.20	<0.10
Thorium-232 (pCi/g)	<0.10	<0.10	<0.10	<0.10	<0.10
Cesium-137 (pCi/g)	<0.10	<0.17	<0.15	<0.16	<0.12
Lead-212 (pCi/g)	NR*	NR	0.31	0.24	0.22
Lead-214 (pCi/g)	0.41	NR	0.36	NR	0.33
Potassium-40 (pCi/g)	7.41	NR	NR	9.37	6.13

\* Not Reported — Lead and potassium were not requested for sediment analysis. They were only reported when detected.

State of Ohio Environmental Protection Agency

**Southwest District Office**401 East Fifth Street  
Dayton, Ohio 45402-2911  
(513) 285-6357  
FAX (513) 285-6249George V. Voinovich  
Governor

March 10, 1995

RE: FERNALD  
ENVIRONMENTAL MONITORING  
OHIO EPA RESULTS FROM  
RESIDENTIAL WELL SAMPLINGMr. Joe Langley  
9824 Hamilton-Cleves  
Cincinnati, Ohio 45030

Dear Mr. Langley:

This letter is to provide you with the analytical results of the water samples collected from your well by Ohio EPA's Office of Federal Facilities Oversight staff, Southwest District Office, on December 27, 1994. The split sampling efforts between Ohio EPA and the Fernald Environmental Restoration Management Corporation (FERMCO) are a part of an Agreement in Principle (AIP). The AIP is an agreement between the Department of Energy (DOE) and the State of Ohio to provide independent oversight and conduct environmental monitoring.

Analytical results are expressed in concentrations of micrograms per liter (ug/l). These units are equivalent to parts per billion (ppb). The samples collected from your well were analyzed for total uranium. The U.S. Environmental Protection Agency (USEPA) has set drinking water standards, or maximum contaminant levels (MCL), for some metals (see attached definitions). However, for total uranium USEPA has established a proposed enforceable standard of 20 ug/l or 20 ppb. All parameters tested from your well water samples were below the maximum contaminant levels (see attached results).

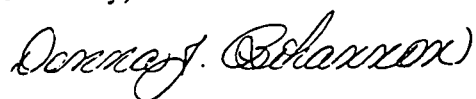
The purpose of split sampling is to check the quality of the laboratories' analyses by comparing both parties' sample results. This process ensures that the results reported are accurate. Once FERMCO receives their results, Ohio EPA will make the comparison and you can do the same.

**000034**

Mr. Joe Langley, Ohio EPA Results  
March 10, 1995  
Page 2

If you have any questions concerning this letter, or if I can be of any further assistance, please do not hesitate to contact me at (513) 285-6453 or Kelly Kaletsky at (513) 284-6454.

Sincerely,



Donna J. Bohannon  
Environmental Monitoring Coordinator  
Office of Federal Facilities Oversight

djb

cc: Pat Kraps, FERMCO, w/attachment  
~~Wally Guader, DOE, w/attachment~~  
Kelly Kaletsky, OEPA/OFFO, w/o attachment

000035

## ENVIRONMENTAL TERMS - DEFINITIONS

Maximum Contaminant Level (MCL): The maximum permissible level of a contaminant in water delivered to any user of a public water system. MCLs are enforceable standards.

Maximum Contaminant Level Goals (MCLGs): A non-enforceable concentration of a drinking water contaminant that is protective of adverse human health effects and allows an adequate margin of safety.

Action Level (AL): A level of a chemical that requires installation of treatment techniques for lowering the contaminant level.

Detection Limit (DL): The detection limit is the lowest level of a chemical that can be distinguished from the normal "noise" of an analytical instrument or method.

Milligrams per Liter (mg/l): A unit used to measure analytical results in concentrations which are equivalent to parts per million (ppm).

Micrograms per Liter (ug/l): A unit used to measure analytical results in concentrations which are equivalent to parts per billion (ppb).

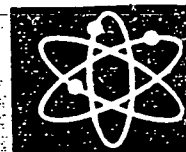
PicoCuries per Liter (pC/l): A unit of measurement for radioactivity. A picocurie is a trillionth of a curie, and represents about 2.2 radioactive particle disintegrations per minute.

CUSTOMER Ross Analytical Services, Inc.  
 ATTENTION Lisa Alexander  
 ADDRESS 16433 Foltz Industrial PKWY  
 CITY Strongsville, OH 44136  
 W.O. NO. 95-01-006

RECEIVED  
 OHIO EP

FEB 17 1995

SOUTHWEST DISTRICT



REPORT OF ANALYSIS

Water-Total Uranium, Radium 226  
 Radium 228

12/29/94  
 SAMPLES RECEIVED

TYPE OF ANALYSIS

CUSTOMER ORDER NUMBER

Customer Identification	Date Collected	Type of Analysis	Sample Vol. (ml)	pci/l	Results
					ug/l
TRB-1294	12/27/94	Ra226	961	<0.1	
TRB-1294	12/27/94	Ra228	1002	3.1±0.8	
S-15-3	12/28/94	TU	251		170
BOK-14-1	12/28/94	TU	249		2.0
E-19-2	12/28/94	TU	249		<0.1
N-4-4	12/28/94	TU	244		1.6
<del>MS-10-5</del>	<del>12/28/94</del>	<del>TU</del>	244		<del>2.8</del>
RB-12-94	12/28/94	TU	236		<0.1
PMS-10-5	12/28/94	TU	512		3.5
MS-10-5	12/28/94	Ra226	1002	<0.1	
PMS-10-5	12/28/94	Ra228	971	18.6±3.5	

\* The result of your water sample is highlighted above.

☐ REPORTED VIA TELEPHONE

☐ FAX

PAGE OF

1 1

**MA Eberline**  
 Thermo Analytical Inc.

2021 PAN AMERICAN FREEWAY, N.E.  
 ALBUQUERQUE, NEW MEXICO 87109  
 ONE (505) 345-3461  
 FAX (505) 761-5416

APPROVED BY Mary Kamoss, Data Analyst 000037

*Mary Kamoss* 2/7/95

# ENVIRONMENTAL MONITORING AT FERNALD

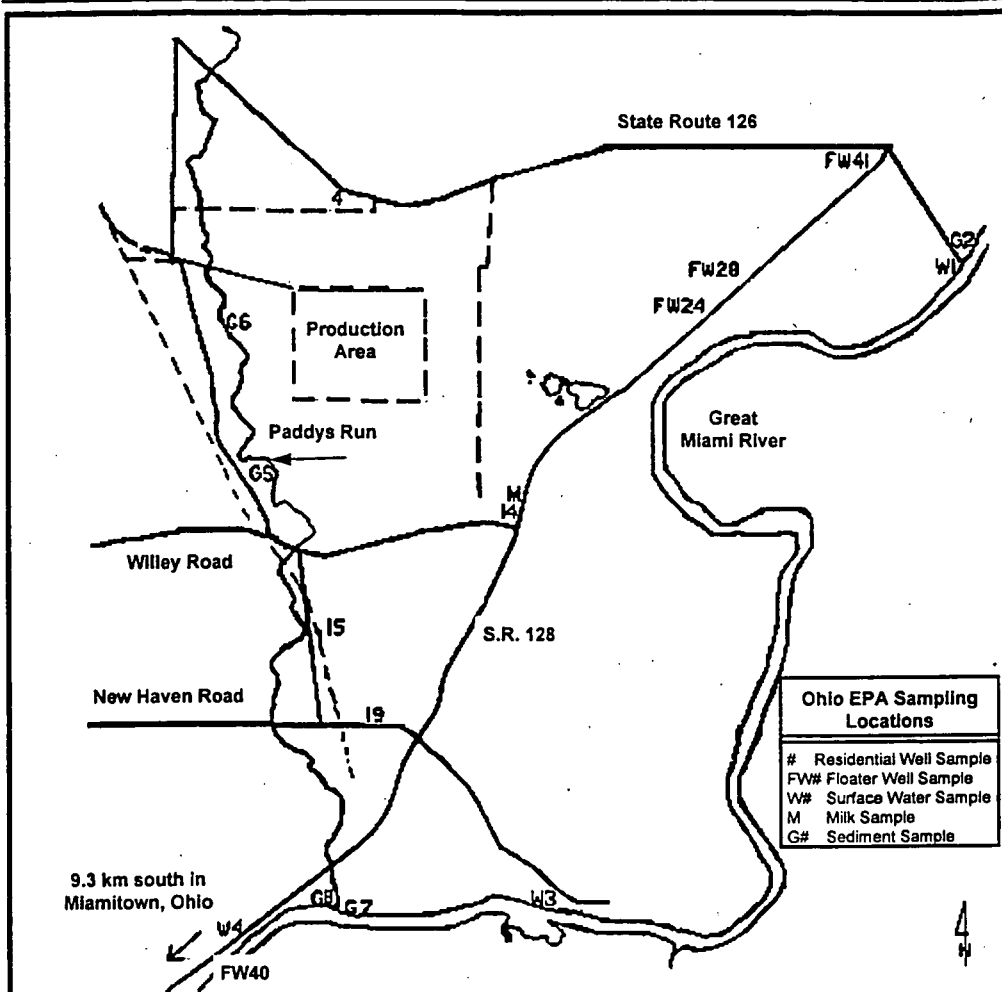
March 1995

## Background

The State of Ohio has conducted environmental monitoring at the U.S. Department of Energy's former nuclear production facility in Fernald, Ohio (referred to as FEMP) since 1987. The Ohio Environmental Protection Agency (Ohio EPA) assumed these responsibilities from the Ohio Department of Health in 1994.

Funding for this enhanced technical support is the result of an Agreement in Principle (AIP) between the State of Ohio and the U.S. Department of Energy (DOE). Ohio's objectives in this agreement are: 1) to ensure the adequacy of Fernald's Environmental Monitoring Program (EMP); 2) to provide emergency preparedness; and 3) to encourage public involvement and education. Ohio EPA's Office of Federal Facilities Oversight (OFFO), in cooperation with the Ohio Department of Health, is currently implementing the first objective.

\* Words in italics are defined on the back page.



Sampling locations at the Fernald Environmental Management Project. Data for these locations can be found in the attached tables.

## Evaluation of Fernald's EMP

As part of its obligation under the AIP, Ohio EPA is leading an evaluation of the EMP at Fernald. During this evaluation, OFFO will take a critical look at how environmental monitoring works at Fernald. The evaluation will be documented in a yearly report which will

be available to the public. Since this is not a one-time evaluation, but rather an ongoing effort, public comments on the EMP will be received throughout the year.

OFFO divided the EMP into separate categories for the purpose of evaluation. These areas include private well water, surface water and

sediment, soil and grass, air, foodstuffs (produce, milk, meat and fish), *dose calculation\**, and public concerns. The *media* are evaluated based on sampling locations, *parameters*, analytical methods, field procedures, and analysis/ interpretation of data.



## Ohio EPA Sampling

Since July 1994, OFFO has conducted *split sampling* with Fernald on a monthly basis. Each month, FEMP and OFFO collect one sample that is then divided or 'split'. The two split samples are sent to different laboratories to ensure independent analysis and quality control. The

media that are split sampled include residential ground water wells, surface water, sediment and milk.

Ohio EPA plans to expand its current sampling program at Fernald to include independent sampling (as opposed to split sampling).

## The Next Step

The Ohio EPA environmental monitoring program at Fernald will continue to expand in 1995. Specifically, OFFO will develop a sampling plan to define the scope and methods for our environmental monitoring program. The sampling plan will define and provide a justification for sampling

locations and procedures as well as analytical methods. The sampling plan will address both independent and split sampling.

The evaluation of the Fernald Environmental Monitoring Program will be ongoing in 1995. OFFO will continue to evaluate changes in site conditions and respond to public concerns.

## Definitions

Dose Calculation - The process of estimating the radiation absorbed.

Media - Specific environments—air, water, soil—which are the subject of regulatory concern and activities.

Parameter - The radiological or hazardous contaminant that is tested for in a sampling event (ie. total U, Ra-226).

pCi/L (picocuries per liter) - A unit of measurement for radioactivity. A picocurie is equivalent to the radioactivity present in one trillionth of one gram of pure radium.

ug/L (micrograms per liter) - A unit used to measure analytical results in concentrations which are equivalent to parts per billion (ppb).

Split Sample - Divide one sample in half from a single location. One half is collected by OFFO and the other half by FERMCO's Environmental Monitoring team. The two samples are sent to different labs and the results are compared. This is a quality control check of the lab's work.

Detection Limit (DL) - The detection limit is the lowest level of a chemical that can be distinguished from the normal "noise" of an analytical instrument or method.

Ohio EPA will continue to evaluate the Environmental Monitoring Program at Fernald. We look forward to public input as this review process evolves. It is especially important to receive public feedback during the development of our independent sampling program.

If you have additional comments or questions, we would like to hear from you. Please contact Ohio EPA's Office of Federal Facilities Oversight at:

Ohio EPA  
Attn: Laura Hegge  
401 East Fifth Street  
Dayton, Ohio 45402-2911  
1-800-686-8930

March 1995

# ENVIRONMENTAL MONITORING AT FERNALD

## BACKGROUND REFERENCE SHEET

Background refers to the naturally occurring amount of a material in the environment. The values listed below represent an approximate range. The values listed only represent those parameters for which Ohio EPA currently samples. Background values for ground water, surface water, and sediment are taken from the Fernald Operable Unit 5 Remedial Investigation Report (October 1994). Background values for milk are taken from the 1993 Site Environmental Report.

### Ground Water/Residential Wells -

Background for Total Uranium in the Great Miami Aquifer is approximately 1.2 ug/L

### Surface Water -

Background values for both the Great Miami River and Paddys Run are approximately:

	<u>Great Miami River</u>	<u>Paddys Run</u>
Total U	1.40 ug/L	1.10 ug/L
Radium-226	0.41 pCi/L	0.35 pCi/L
Radium-228	2.20 pCi/L	2.10 pCi/L

### Milk -

The background value for milk is taken about 23 miles WSW of the Fernald site:

Uranium-234	0.0650 ± 0.0330 pCi/L
Uranium-235	-0.0035 ± 0.0076 pCi/L
Uranium-238	0.0670 ± 0.0330 pCi/L

### Sediment -

Background for sediment in both the Great Miami River and Paddys Run are approximately:

	<u>Great Miami River</u>	<u>Paddys Run</u>
Total U	3.00 ug/g	3.00 ug/g
Radium-226	0.57 pCi/g	0.50 pCi/g
Thorium-228	not detected	not available
Thorium-230	0.72 pCi/g	"
Thorium-232	0.80 pCi/g	"
Cesium-137	not detected	"

## PROPOSED DRINKING WATER STANDARDS:

The proposed US EPA standard for uranium in drinking water is 20 ug/L.

The proposed US EPA standard for radium-226 in drinking water is 20 pCi/L.

The proposed US EPA standard for radium-228 in drinking water is 20 pCi/L.



**GROUND WATER/RESIDENTIAL WELLS  
1994 SAMPLING RESULTS FOR TOTAL URANIUM (ug/L)**

WELL # →	4	14	15	19	Floater (FW#)
SEPTEMBER	1.38	1.89	177.00	<0.10	0.57 (FW24)
OCTOBER	1.23	1.78	144.00	<0.10	0.38 (FW28)
NOVEMBER	1.20	2.00	179.00	<0.10	0.43 (FW41)
DECEMBER	1.60	2.00	170.00	<0.10	2.80 (FW40)

**SURFACE WATER  
1994 SAMPLING RESULTS**

MONTH/LOCATION	TOTAL U (ug/L)	Radium-226 (pCi/L)	Radium-228 (pCi/L)
SEPTEMBER	W1 1.47	<1.00	1.98
	W3 1.47	<1.00	<1.00
	W4 1.00	<1.00	2.49
OCTOBER	W1 1.74	<1.00	5.06
	W3 1.78	<1.00	<1.00
	W4 1.93	<1.00	<1.00
NOVEMBER	W1 1.47	<1.00	<1.00
	W3 1.47	<1.00	<1.00
	W4 1.47	<1.00	<1.00

**MILK  
1994 SAMPLING RESULTS**

MONTH/LOCATION	U-234 (pCi/L)	U-235 (pCi/L)	U-238 (pCi/L)
SEPTEMBER M	0.0249	<0.0268	<0.0239
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SAMPLING RESULTS (NOVEMBER, 1994)**

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